



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety Administration**

February 7, 2011

East Building, PHH – 30
1200 New Jersey Avenue, Southeast
Washington, D.C. 20590

DOT-SP 14966
(FIRST REVISION)

EXPIRATION DATE: May 31, 2012

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Vulcore Industrial LLC
Ft. Wayne, Indiana
2. PURPOSE AND LIMITATIONS:
 - a. This special permit authorizes the manufacture, marking, sale and use of a non-DOT specification, pre-braided fully wrapped carbon composite (PBFWCC) gas cylinder with a non-metallic and non-load sharing plastic liner as described in Vulcore Industrial application on file with the Office of Hazardous Materials Special Permits and Approvals (OHMSPA). The most recent revision supersedes all previous revisions.
 - b. The safety analyses performed in development of this special permit only considered the hazards and risks associated with transportation in commerce. The safety analyses did not consider the hazards and risks associated with consumer use, use as a component of a transport vehicle or other device, or other uses not associated with transportation in commerce.
 - c. Party status will not be granted to this special permit.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR § 173.302a in that the use of a non-DOT specification or UN cylinder is not authorized except as specified herein.

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5. BASIS: This special permit is based on the application of Vulcore Industrial LLC dated August 24, and additional information dated September 27, 2010 and January 20, 2011 submitted in accordance with § 107.105 and the public proceeding thereon.
6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Material Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Air, compressed (containing up to 39% by volume oxygen)	2.2	UN1002	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Packaging prescribed is a non-DOT specification, Pre-Braided Fully Wrapped Carbon Composite (PBFWCC) cylinder with a non-metallic and non-load sharing plastic liner as described in Vulcore Industrial application on file with the Office of Hazardous Materials Special Permits and Approvals (OHMSPA). Each of these PBFWCC cylinders must meet all the design performance requirements (e.g. min. burst pressure, all cycling tests) for UN composite cylinders specified in § 178.71(l) and of ISO Standard 11119-3 (Gas Cylinders of Composite Construction- Specification and Test Methods - Part 3: Fully wrapped fiber reinforced composite gas cylinders with non-metallic and non-load-sharing metallic liners) except as described following:

(1) Cylinders made under this special permit are limited to a maximum water volume and service pressure of 2 liters and 345 bar (5,000 psig) respectively.

(2) Each cylinder must be designed to have the ratio of burst pressure (P_b) over test pressure (P_h) greater than or equal to 2 ($P_b/P_h = 2$).

(3) All of the batch inspection and testing must be performed to meet the 12,000 cycle pressure cycling test using test pressure, P_h , as described in § 8.5.4 of ISO 11119-3.

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(4) Cylinders with water volume ≤ 2 liters are authorized the following exception from the requirement of ISO 11119-3:

(i) § 8.2.7 - The IIA must supervise all testing as specified in this special permit (see Table 2 here in).

(ii) § 8.3.2(d) - a minor change to a resin component that is within the same specification (i.e. from one epoxy to another) may be qualified as a design variant.

(iii) § 8.4 - Attached Table 2 (qualification tests) may be used in lieu of Table 2 of ISO 11119-3.

Table 2. Qualification tests for cylinders with water volume and test pressure less than or equal to 2 liters and 345 bars.

Test No.	Test	New design	Design variant changes									
			Length		Diameter		Liner thickness or mfg.	Equiv. fiber	Test pressure		Composite thickness or pattern	Equiv. matrix
			$\leq 50\%$	$> 50\%$	$\leq 20\%$	$> 20\% \leq 50\%$			$\leq 20\%$	$> 20\% \leq 60\%$		
9.1	Liner material						X					
9.3	Overwrap materials							X			X	X
8.5.1	Hydraulic proof pressure	X	X	X	X	X	X	X	X	X	X	X
8.5.3	Burst pressure	X	X	X	X	X		X	X	X	X	X
8.5.4	Ambient cycle	X	X	X	X	X	X	X	X	X	X	
8.5.6	Environmental cycle	X										
8.5.7	High temperature creep	X				X ^a					X ^a	
8.5.8	Flaw	X				X						
8.5.9	Drop	X		X		X		X			X	
8.5.10	High velocity impact (gunfire)	X				X ^b					X	
8.5.11	Fire resistance	X		X		X						

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8.5.12	Permeability	X				X	X					
8.5.15	Leak	X			X	X	X		X			
a) Where burst pressure to test pressure ratio of design variant is over 20% greater than the same ratio for the approved design.												
b) Test to be conducted for reduction in diameter only.												

(iv) § 8.5.11.1: Pressure relief devices must be in accordance with CGA S-1.1, except that they may be qualified for service pressures up to 345 bar (5,000 psig);

(v) §§ 10.1 & 10.2 - marking must contain the following:

(A) DOT special permit number followed by service pressure expressed in bar (psig). Marking may be on label permanently attached to the outside of the cylinder.

(B) A serial number and the manufacturer's identification number or a symbol as obtained from the Associate Administrator for Hazardous Materials Safety, located just below or immediately following the DOT marking. The serial number and the manufacturer's identification number may be placed on each cylinder as described in Vulcore application on file with OHMSPA.

(C) The DOT inspector's official mark must be placed near the serial number. The marking must contain date the (month and year) of the initial hydraulic proof pressure test for that cylinder.

(D) The size of the letters and numbers used must be at least 0.32 cm (1/8 inch) high if space permits.

(E) The following are examples of an authorized format for marking:

DOT-SP AAAAA-YYYY

(where AAAAA is the special permit number and YYYY is the service pressure)

CCCC MMI

(where CCCC is the serial number and MMI is the manufacturer's mark or symbol)

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DDD - MM/YY

(where DDD is the inspectors mark and MM/YY is the month and year of the hydraulic proof pressure test).

(F) Additional markings are permitted, provided the additional markings do not obscure the required marking and are not detrimental to the integrity of the cylinder. Provisions for marking of the required requalification dates and RIN information must be made near the cylinder markings.

(5) Cylinders intended exclusively for Self-Contained Breathing Apparatus (SCBA) may be manifolded as an assembly and installed into a protective cover (cylinder-pack). The cylinder-pack must meet the following conditions:

- (i) Contains a maximum of 5 cylinders. Each cylinder has a maximum water volume of 2 liters;
- (ii) Each cylinders of the cylinder-pack must be designed and tested in accordance with all requirements of ISO 11119-3 as specified in this permit;
- (iii) The manifold assembly burst pressure is equal to or greater than two times the test pressure of the cylinder; and
- (iv) For each batch (lot) of cylinders - one cylinder-pack including the manifold assembly and components is subjected to a drop test from a height of 1.2 meters. After the drop test, cylinders, manifold assembly and components must be leak tested and remain leak free.

b. REQUALIFICATION -

(1) Each cylinder must be requalified once every 5 years by a qualified person holding a valid DOT RIN using a hydraulic or pneumatic proof pressure test equal to 1.5 times the marked service pressure and hold the pressure for a minimum of 3 minutes without a loss of pressure. Each cylinder must visually be inspected in accordance with CGA Pamphlet C-6.2 Guidelines for Visual Inspection and Re-qualification of Fiber Reinforced High Pressure Cylinders.

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(2) For cylinder-pack described in paragraph 7.(a)(5) - cylinder assembly (cylinders and manifold) must be removed from the cylinder-pack. The cylinder assembly must be requalified as described in paragraph 7.(b)(1) of this special permit using a hydraulic or pneumatic proof pressure test equal to 1.5 times the marked service pressure and hold the pressure for a minimum of 3 minutes without a loss of pressure.

(3) Additionally, as part of this requalification each cylinder must visually be inspected in accordance with CGA Pamphlet C-6.2 Guidelines for Visual Inspection and Re-qualification of Fiber Reinforced High Pressure Cylinders.

(4) Requalification date (month/year) must be permanently marked on the cylinder as specified in paragraph § 180.213. The marking of the RIN symbol on the cylinder certifies compliance with all of the terms and conditions of this special permit. For cylinder-pack Requalification date (month/year) must be permanently marked on the outside of the cylinder-pack.

c. OPERATIONAL CONTROLS -

(1) Cylinders manufactured under this special permit are not authorized for use after 15 years from the date of manufacture of this special permit.

(2) Cylinder-pack described in paragraph 7.(a)(5) are limited to Self-Contained Breathing Apparatus (SCBA) use only.

(3) Cylinders may not be used for underwater breathing purposes.

(4) A cylinder that has been subjected to fire may not be returned to service.

8. SPECIAL PROVISIONS:

a. In accordance with the provisions of Paragraph (b) of § 173.22a, persons may use the packaging authorized by this special permit for the transportation of the hazardous materials specified in paragraph 6, only in conformance with the terms of this special permit.

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- b. A person who is not a holder of this special permit, but receives a packaging covered by this special permit, may reoffer it for transportation provided no modification or change is made to the packaging and it is offered for transportation in conformance with this special permit and the HMR.
 - c. A current copy of this special permit must be maintained at each facility where the package is offered or reoffered for transportation.
 - d. Each packaging manufactured under the authority of this special permit must be either (1) marked with the name of the manufacturer and location (city and state) of the facility at which it is manufactured or (2) marked with a registration symbol designated by the Office of Hazardous Materials Special Permits and Approvals for a specific manufacturing facility.
 - e. Cylinder-pack described in this special permit must include all markings described in § 7.(a).(4)(v) with the exception of the serial numbers for the cylinders. Marking must be permanently attached to the outside of the cylinder-pack. Additional markings may be added provided it would not interfere with the required marking of this special permit.
 - f. A current copy of this special permit must be maintained at each facility where the packaging is manufactured under this special permit. It must be made available to a DOT representative upon request.
 - g. The cylinders described in this special permit are authorized only for normal transportation as an article of commerce i.e., the movement of hazardous materials packages from consignor to consignee.
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, cargo aircraft, cargo vessel, passenger-carrying aircraft, rail freight.
10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each cargo vessel, aircraft or motor vehicle used to transport packages covered by this special permit. The shipper must furnish a current copy of this special permit to the air carrier before or at the time the shipment is tendered.

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11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

- o All terms and conditions prescribed in this special permit and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
- o Persons operating under the terms of this special permit must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
- o Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this special permit, including display of its number, when this special permit has expired or is otherwise no longer in effect.

Under Title VII of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)—"The Hazardous Materials Safety and Security Reauthorization Act of 2005" (Pub. L. 109-59), 119 Stat. 1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term "exemption" to "special permit" and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this special permit are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 Immediate notice of certain hazardous materials incidents, and 171.16 Detailed hazardous materials

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incident reports. In addition, the grantee(s) of this special permit must notify the Associate Administrator for Hazardous Materials Safety -- OHMSPA, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit.

Issued in Washington, D.C.:



for Dr. Magdy El-Sibaie
Associate Administrator for Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Material Safety Administration, U.S. Department of Transportation, East Building PHH-30, 1200 New Jersey Avenue, Southeast, Washington, D.C. 20590.

Copies of this special permit may be obtained by accessing the Hazardous Materials Safety Homepage at http://hazmat.dot.gov/sp_app/special_permits/spec_perm_index.htm Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

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